

**CITY OF CATHEDRAL CITY
CALIFORNIA**

**PEREZ ROAD VICINITY SEWERS
DESIGN MEMORANDUM**

FINAL



PREPARED FOR

**CATHEDRAL CITY ENGINEERING DEPARTMENT
68-700 Avenida Lalo Guerrero
CATHEDRAL CITY, CA 92234
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PROJECT DESCRIPTION

The proposed Perez Road Vicinity Sewers improvement project lies within the City of Cathedral City in Riverside County. The project is located in the Downtown area of the City bounded on the west and south by the Cathedral Canyon Channel, the east by Date Palm Drive and on the northeast by the Whitewater River.

The purpose of this memorandum is to discuss the proposed sewer system and the design criteria related to it. Currently, the area is served by individual septic tank and seepage pit systems.

The proposed sewer improvements will include installation of approximately 11,800 linear feet of new gravity sewer mains, manholes and laterals available for connection to each lot in the area adjacent to the sewer mains. This sewer will flow generally southeasterly and cross under Cathedral Canyon Channel on Date Palm Drive to an existing manhole. From this manhole sewerage will flow into an existing pump station located on Date Palm Drive between Buddy Rogers Drive and the Cathedral Canyon Channel.

The governing jurisdiction for the sewer system is the Desert Water Agency (DWA).

PRELIMINARY EVALUATION OF FEASIBLE ALIGNMENT

In a coordination meeting between Psomas, DWA staff stated that sewers should be located at a 5-foot offset from street centerline on the opposite side of the street from any water lines. Acknowledging that water lines are not uniformly on the same side of the street, it was accepted that the sewer may need to switch from one side of the street to the other.

California Waterworks Standards set a minimum separation requirement between parallel sewer and water lines of 10-feet, measured from the nearest edges of facilities. It is also required that water lines maintain a minimum 12-inch vertical separation over sewer facilities in crossing conditions.

DWA prefers that any sewer alignment parallel to the Cathedral Canyon Channel be located within Riverside County Flood Control and Water Conservation District (RCFC&WCD) right-of-way. This encroachment must be justified and approved by the RCFC&WCD. The alignment has been reviewed and the feasibility has been established due to the need for the sewer line, and the extreme level of impact to private property if the line was not constructed in the north access road of the Cathedral Canyon Channel. The encroachment permit for both the channel crossing at the Date Palm Bridge, and the main line construction in the right-of-way have been approved by the RCFC&WCD.

Per our discussions with RCFC&WCD, their policy is that encroaching parallel pipelines be located within 5 feet of the right-of-way. Due to the 8-inch diameter of the proposed encroaching pipe, RCFC&WCD Staff have agreed that the pipe may be centered 5 feet from the northerly right-of-way.

Psomas will implement these standards in design. The 30% improvement plans are included with this document, as Appendix C.

CHANNEL CROSSING

Psomas has designed profiles for the proposed sewer alignments based upon DWA design standards discussed above. A siphon structure will not be necessary. Based upon these profiles it is feasible to cross under the two span simply supported bridge with PCC lined channel at Date Palm Drive and the North Cathedral Canyon Channel by means of gravity flow. It is anticipated that construction of the channel crossing will be accomplished by means of small diameter microtunneling and pipe jacking.

A minimum vertical clearance of 3-feet will be maintained between bottom of bridge flow line and top of pipe or casing at the sewer crossing of the North Cathedral Canyon Channel. This is in compliance with requirements of RCFC&WCD communicated to Psomas at a coordination meeting held with RCFC&WD Staff. (October 24, 2007, see Appendix B)

DESIGN CRITERIA

The Desert Water Agency design standards, which are included in their Sanitary Sewer Construction Specifications, dated 1996, have been used as the basis for design. The following lists the pertinent design criteria/data used for this project

1. Sewer Pipe Size

A sewer master plan prepared by Krieger & Stewart dated May 30, 1996 and adopted by DWA in 1996, proposed pipe sizes for the project area. This study determined a combination of 8" diameter and 15" diameter sewer pipes were appropriate for sewer flows generated in this area. DWA and Psomas has reviewed the report and concurs with its findings.

2. Sewer Main Material

DWA Sewer Construction Specifications require use of extra strength vitrified clay pipe (VCP) for gravity sewer mains. Psomas has found no condition to indicate this requirement should not be complied with.

3. Pipe Slope

DWA sewer design standards do not specifically address required minimum and maximum pipe slopes. In the above mentioned coordination meeting DWA Staff indicated that Eastern Municipal Water District (EMWD) design standards should be applied whenever DWA guidelines do not provide sufficient information. EMWD standards for minimum pipe slope are 0.0040 ft/ft for 8" diameter pipe and 0.0016 for 15" diameter pipe. Maximum slopes for the same diameter pipes are 0.1200 and 0.0500, respectively.

4. Sewer Depth of Cover

Per DWA sewer design standards, sewer mains shall have 7' minimum cover and

shall be lower than nearby water lines, if possible. In areas where sewer alignment is located in flood control right-of-way RCFC&WCD requires the sewer pipe to also be lower than the bottom of flood control channel.

5. Manholes

Manholes shall be spaced at 300' maximum intervals. DWA Standard Drawing S104 defines the size of manholes based upon diameter of sewer pipe. As all proposed pipes are less than 24" diameter, all the manholes shall be 48" diameter. The drop across the manholes shall be 0.1' minimum. Manholes will be adjusted to finished grade after the new pavement is installed in areas of the project where street rehabilitation is associated with the sewer construction.

RCFC&WCD requires and DWA accepts that any manholes located in unpaved areas of their right-of-way be located six inches below finished grade. A sump is to be created at each manhole for ease of driving and a marker or plaque attached to the adjacent right-of-way fence for identification of manhole locations. In time the sump will fill in, and the plaque will help find the lid.

6. Sewer Laterals

Each lot adjacent to the proposed sewer mains will receive one lateral. Additional laterals may be provided if necessary at the owner's expense. All laterals serving commercial lots shall be 6" diameter. Sewer laterals will be installed up to the property line and will include the wye connection at the main, vitrified clay pipe to the property line and a sewer cleanout at the property line. Pipe slope shall be 2% typical with 1% as a minimum. Laterals and cleanouts shall be per DWA Standard Drawing S107, S106, and as shown in the construction documents.

Lateral location will be determined based on main flow direction, and the location of each building's sewer outlet point. Effort will be made to place laterals at locations that will be the least disruptive for the property owner to connect to.

7. Trench Section

The proposed trench section shall be per DWA Standard Drawing S101, S102, the City Standards, and RCFC&WCD Standards. A geotechnical investigation will be conducted by Geomatrix, Inc. Recommendations from this investigation will be used in conjunction with all applicable standard plans and specifications to design trench and bedding conditions for the proposed sewer.

PRELIMINARY OPINION OF PROBABLE CONSTRUCTION COSTS

See Appendix A

PRELIMINARY CONSTRUCTION SCHEDULE

Based on an assumed construction estimate of approximately 100 linear feet of pipe per day, the construction of the sewers will take approximately 8 months. A construction schedule will be developed with input from the City to establish permanent dates,

milestones, and deadlines. The schedule will incorporate the street rehabilitation project.

PERMITTING

Permits required for this project are included in the following table:

<u>Permit</u>	<u>Issuing Agency</u>
Encroachment Permit	RCFC&WCD - DONE
CEQA NOE	State of California

LIST OF AFFECTED UTILITIES

Desert Water Agency
Southern California Edison
The Gas Company
Verizon
Time Warner Cablevision

FUTURE ACTION ITEMS

NEW SEWER ALIGNMENT AT DATE PALM

The City has asked Psomas to review alternate alignments to avoid construction of the sewer pipe in Date Palm Drive. Psomas is currently developing alternate alignments for the City's review. The new alignment would cross the North Cathedral Canyon Channel in a different location, east of Date Palm Drive. If a new alignment is chosen by the City, A new encroachment permit will need to be obtained from RCFC&WCD.

RIGHT-OF-WAY REQUIREMENTS

At this time no additional right-of-way is needed for the sewer improvements in their current configuration. Right-of-way acquisition will be necessary if the City chooses to not construct the sewer improvements in Date Palm Drive. Temporary construction easements may be needed to construct the laterals.

APPENDIX A

**PRELIMINARY OPINION OF PROBABLE
CONSTRUCTION COSTS**

SEWER MAINS

	QTY	UNITS	UNIT COST	TOTAL
8" VCP (7-10')	2,323	LF	\$95.00	\$220,654
8" VCP (10-15')	4,552	LF	\$105.00	\$477,922
15" VCP (7-10')	820	LF	\$180.00	\$147,600
15" VCP (10-15')	3,304	LF	\$190.00	\$627,682
15" VCP (15-20')	185	LF	\$300.00	\$55,500

SEWER MAINS SUBTOTAL: \$1,529,358

LATERALS AND CLEANOUTS

	QTY	UNITS	UNIT COST	TOTAL
6" VCP (6 LF Each)	10	EA	\$510	\$5,100
6" VCP (34 LF Each)	24	EA	\$2,890	\$69,360
6" VCP (40 LF Each)	2	EA	\$3,400	\$6,800
6" VCP (44 LF Each)	34	EA	\$3,740	\$127,160
6" VCP (46 LF Each)	10	EA	\$3,910	\$39,100
6" VCP (50 LF Each)	11	EA	\$4,250	\$46,750
6" VCP (56 LF Each)	13	EA	\$4,760	\$61,880
6" VCP (77 LF Each)	1	EA	\$6,545	\$6,545
6" VCP (94 LF Each)	1	EA	\$7,990	\$7,990
SEWER CLEANOUT	106	EA	\$510	\$54,060

LATERALS SUBTOTAL: \$424,745

MANHOLES

	QTY	UNITS	UNIT COST	TOTAL
Precast concrete (8'-10')	14	EA	\$8,400	\$117,600
Precast concrete (10'-15')	31	EA	\$10,400	\$322,400
Precast concrete (15'-20')	1	EA	\$12,400	\$12,400

MANHOLES SUBTOTAL: \$452,400

SEPARATE ITEMS

	QTY	UNITS	UNIT COST	TOTAL
Mobilization/Demobilization	1	LS	\$150,000.00	\$150,000
Traffic Control	1	LS	\$80,000.00	\$80,000
Dust Control	1	LS	\$30,000.00	\$30,000
Trench Shoring	1	LS	\$50,000.00	\$50,000
Pipe Jacking	1	LS	\$45,000.00	\$45,000

SEPARATE ITEMS SUBTOTAL: \$310,000

CONSTRUCTION SUBTOTAL (Rounded): \$2,720,000

15% Contingency: \$408,000

CONSTRUCTION TOTAL (Rounded): \$3,128,000

APPENDIX B

**PEREZ ROAD & VICINTIY SEWERS
DWA COORDINATION
MEETING HIGHLIGHTS**

Date: October 3, 2007

Project No.: 2CAT060400

Time: 9:00 AM

Location: DWA offices

Subject: Perez Sewer Master Plan Review

Attendees:	SJ	Steve Johnson, DWA	760.323.4971	sjohnson@dwa.org
	AV	Anissa Voyiatzes, Psomas	714.751.7373	avoyiatzes@psomas.com
	MV	Mark Verrengia, Psomas	714.751.7373	mverrengia@psomas.com

The following is a summary of issues discussed during the coordination meeting:

1. SJ let Psomas know that the master plan is still valid. Pipe sizes specified on the master plan should still be valid as land use has not changed significantly.
2. The location of the sewer should be 5' off centerline opposite of the water lines, but will be examined on a case by case basis as this is an improvement situation and will need to flip from one side of centerline to the other from street to street to avoid conflicts with existing utilities. SJ referred to this as "whatever works, as long as sewer is opposite centerline of water."
3. DWA prefers to use Eastern Municipal Water District (EMWD) as a design guideline when ever their design standards do not provide enough information.
4. DWA prefers to see the sewer line in the access road along the North side of the flood control channel for ease of access and construction. They would prefer not to have it in the parking lots and landscape area behind the businesses North of the flood control channel.

Action Items:

1. SJ will talk to Kreager & Stewart about what it took to get RCFCDD approval for building Sewer in the South Access Road of the flood control channel.
2. AV and/or MV to talk to Ed Lotz about building the sewer line in the flood R/W.
Update: MV met with Ed Lotz on 10/24/07
3. MV to check to see what water & sewer plans we have.
4. AV or MV to check out drain pipe for abandoned water well on Cathedral Canyon. Can be relocated if absolutely necessary, however, DWA prefers to protect it in place. If relocation is necessary, it can be connected to a different storm drain system. It can't connect to sewer.

Psomas prepared the preceding minutes, which are interpretations of items discussed and decisions reached at the above referenced meeting. Any persons desiring to add or otherwise change the minutes, are asked to send their comments in writing or email to Anissa Voyiatzes at Psomas (avoyiatzes@psomas.com or Fax (714/545-8883) no later than one week following the date minutes were prepared; otherwise the minutes will stand as written.

Distribution: Steve Johnson, DWA

Anissa Voyiatzes, Psomas
Bill Bayne, Cathedral City
Pavel Horn, Cathedral City
Bill Clapper, NAI Consulting

**PEREZ ROAD & VICINTIY SEWERS
RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION
DISTRICT (RCFC & WCD) MEETING HIGHLIGHTS**

Date: October 24, 2007 **Project No.:** 2CAT060400
Time: 1345 hrs
Location: RCFC & WCD offices
Subject: Perez Rd Vicinity Sewers - RCFC & WCD Pre-Design Coordination Meeting

Attendees:

EL	Ed Lotz, RCFC & WCD	951.955.1266	elotz@co.riverside.ca.us
MV	Mark Verrengia, Psomas	714.751.7373	mverrengia@psomas.com

The following is a summary of issues discussed during the Meeting:

1. Discussed the design criteria to follow for placing the sewer line in the access road parallel to the channel
 - a. Respond to each of the 5 items on the policy requirements for utilities in the district right of way (Item 4 is not applicable). Give a summary of the project, provide exhibits or design plans that show proposed and existing alignments of all utilities, both permitted and non (label as such). Include a section as well.
 - b. Per item 5 of the policy requirements for utilities in the district right of way, utilities must be located within 5-ft of the Flood Control R/W, however EL said that he would be okay with an 8-in sewer line being centered on the 5-ft if it will ease construction. Manholes must be recessed 6-in below finish grade. Create a sump at each manhole for ease of driving and a plaque on the chain link fence is okay to identify the location of the manhole once it gets covered.
 - c. Try to stay below the flowline of the channel with the new sewer if at all possible to prevent sewage from spilling into the channel should a leak in the sewer line occur. This is not an RCFC policy, just a good idea.
2. Discussed the design criteria for crossing under the channel on Date Palm Dr.
 - a. 3-ft clearance from the bottom of the RCB or channel liner to the top of the pipe or casing for pipe. No special encasement is required.
3. We will only need to pay for one encroachment permit for both conditions. EL said to pay for the parallel utilities encroachment and it would cover the crossing fee and permit.

4. EL went through the Encroachment Permit Checklist with me and determined that Items 6 through 10 are not applicable for this project, however, items 1 through 5, 11, & 12 will be required.

Action Items:

1. Get As-built of North Cathedral Canyon Channel from Repro. (completed)
2. Check with DWA to see if they have an approved and filed CEQA. Get a copy of it.

Psomas prepared the preceding minutes, which are interpretations of items discussed and decisions reached at the above referenced meeting. Any persons desiring to add or otherwise change the minutes, are asked to send their comments in writing or email to Anissa Voyiatzes at Psomas (avoyiatzes@psomas.com or Fax (714/545-8883) no later than one week following the date minutes were prepared; otherwise the minutes will stand as written.

Distribution: Ed Lotz, RCFC & WCD

Steve Johnson, DWA

Anissa Voyiatzes, Psomas

Bill Bayne, Cathedral City

Pavel Horn, Cathedral City

Bill Clapper, NAI Consulting

Attachment(s): Encroachment Permit Application & Requirements